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Attorney's Docket No.: 09350-005005

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FACSIMILE

FOR THE PERSONAL ATTENTION OF:

EXAMINER KAMEN

GROUP 3747 FAX NO: 703-872-9306

Number of pages including this page 29

Applicant :	Robert A. Sanderson, et al.	Art Unit :	3747
Serial No. :	09/696,139	Examiner :	Kamen
Filed :	October 25, 2000		
Title :	PISTON ENGINE ASSEMBLY		FACSIMILE COMMUNICATION


Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached to this facsimile communication cover sheet is an Information Disclosure Statement, PTO-1449, English translation of German reference 1 037 799, Request for Amended Drawings, 1 sheet of Drawings, and copies of the office actions mailed October 2, 2002 and May 28, 2003 in related application Serial No. 09/778,629, filed February 7, 2001, faxed this 18th day of February, 2004, to Group 3747, the United States Patent and Trademark Office.

Respectfully submitted,

Date: February 18, 2004


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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,629	02/07/2001	Robert A. Sanderson	09850-014001	9606

26171 7590 10/02/2002

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EXAMINER

KYLE, MICHAEL J

ART UNIT

PAPER NUMBER

3676

DATE MAILED: 10/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Drawings Required w/ Resp.

Docketed By	Practice Systems
Action Code:	Resp 100A
Base Date:	10-2-02
Due Date:	1-2-03
Deadline:	4-2-03
Initial:	Jmc

Docketed By	Billing Secretary
Due Date:	1-2-03
Deadline:	4-2-03
Initials:	efc

Office Action Summary	Application No. 09/778,629	Applicant(s) SANDERSON ET AL. <i>h</i>	
	Examiner Michael J Kyle	Art Unit 3676	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce a 1y earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-15 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 14 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	6) <input type="checkbox"/> Other: _____

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DETAILED ACTION***Specification***

1. The disclosure is objected to because of the following informalities: Line 26 on page 9 refers to "carburetor 56c" in figure 10, however, 56c is not shown in figure 10.
2. Page 13, line 17 reads, "are 180° apart". The examiner believes that "180°" should be changed to "180°".

Appropriate correction is required.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "56c", as described on page 9, line 26 of the specification. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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5. Claim 15 recites the limitation "the common axis" in line 6 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aragona (U.S. Patent No. 4,505,187) in view of Scalzo (U.S. Patent No. 4,433,596).

7. Aragona discloses a joint (24) for positioned between first and second elements being arranged for liner motion along a common axis comprising an outer member (50) that defines an opening for receiving a drive arm (44), and an inner member (48) that defines an opening for receiving the drive arm (44). Aragona does not disclose the outer member to be configured for movement relative first element along a first axis perpendicular to the common axis, the outer member defining first and second parallel flat sides, and each flat side perpendicular to the common axis. Aragona also does not disclose an inner member mounted within the outer member for rotation relative to the outer member about a second axis perpendicular to the first axis and the common axis, or for movement relative to the outer member along the second axis, the outer member being restrained from movement along the second axis.

Scalzo discloses a joint for movement along a common axis comprising an outer member (28) configured for movement relative first element along a first axis perpendicular to the

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common axis, the outer member (28) defining first and second parallel flat sides, on the outer face, (shown in figure 1), and each flat side perpendicular to the common axis. Scalzo further discloses an inner member (30) mounted within the outer member (28) for rotation relative to the outer member (28) about a second axis perpendicular to the first axis and the common axis, and for movement relative to the outer member (28) along the second axis, the outer member (28) being restrained from movement along the second axis, and for the inner member to have a first concave inner face for the purpose of allowing the necessary degrees of freedom for full movement of the drive arm of the drive plate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the joint of Aragona as taught by Scalzo for the purpose of creating a simpler construction for the joint.

8. With respect to claims 2-4, Aragona discloses that the inner member (48) comprises a cylindrical member (48), that the outer member (50) is configured to rotate about the common axis, and that the outer member of the joint comprises a two piece member (50, 52)

9. With respect to claims 5-6, Aragona, as modified by Scalzo, discloses that each piece of the two piece member includes a first concave inner face (52 of Aragona, 28 of Scalzo).

Aragona also discloses that each piece of the two piece inner member includes an additional concave inner face arranged perpendicular to the first concave inner face (shown in figure 4).

10. With respect to claims 7-8, Aragona, as modified by Scalzo, discloses that each two piece member includes a flat outer face (figure 1 of Scalzo). Aragona discloses that each piece of the two piece member includes a curved outer wall.

11. With respect to claims 11-13, Aragona discloses that the first and second elements each comprise a piston (18). Aragon also discloses the first element to comprise a piston (18), and the

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second element to comprise a guided rod (22). Furthermore, Aragona discloses a connector (24) for mounting the first and second elements (18) thereto, the connector defining a cavity, the outer member (50) and inner member (48) being positioned within the cavity.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aragona in view of Scalzo as applied to claim 8 above, and further in view of Kenny (U.S. Patent No. 4,489,682). Neither Aragona nor Scalzo disclose that each piece of the two piece member includes two curved outer walls.

Kenny teaches a piston joint wherein each piece (18, 18') has two curved outer walls for the purpose of allowing movement within the housing (11). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the outer members of Aragona and Scalzo as taught by Kenny in order to provide another degree of freedom for the outer member.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aragona in view of Scalzo as applied to claim 4 above, and further in view of Kenny. Aragona discloses the outer member (50) to comprise a two piece member (50, 52), and each two piece member to have first and second concave perpendicular cutouts on an inner face. Scalzo discloses a flat outer face. However, neither Aragona nor Scalzo discloses the outer member to have two curved sidewalls.

Kenny teaches two curved sidewalls for the purpose of allowing movement within the housing (11). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the outer members of Aragona and Scalzo as taught by Kenny in order to provide another degree of freedom for the outer member.

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14. Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Aragona in view of Scalzo as applied to claim 13 above, and further in view of Kenny. Neither Aragona nor Scalzo discloses that the connector defines a rectangular cavity having four flat inner walls.

Kenny teaches a piston joint wherein the connector (11) defines a cavity having four flat inner walls (sides 12, top and bottom of cavity) to allow the outer member (18, 18') to slide. Therefore, it would have been obvious to one of ordinary skill in the art to modify the connector of Aragona and Scalzo as taught by Kenny to provide for a sliding motion in certain directions, and restrict motion in other directions.

15. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aragona in view of Scalzo. Aragona discloses a method of reducing side load in a double ended member including first and second elements (20), the method comprising providing a joint (24) between first and second elements (20), the outer member defining an opening for receiving a drive arm (44), and an inner member (48) defining an opening for receiving the a drive arm (44). Aragona also discloses transferring load between first and second elements (20) and a drive arm (44) mounted to the joint (24) through two opposed surface of the outer member. Aragona does not disclose the joint to include an outer member configured for movement relative to the first and second elements along a first axis perpendicular to a common axis, the outer member defining first and second parallel flat sides, each flat side defining a plane perpendicular to the common axis, or an inner member mounted within the outer member for rotation relative to the outer member about a second axis perpendicular to the first axis and the common axis for movement relative to the outer member along the second axis, the outer member being restrained from movement along the second axis.

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Scalzo teaches a piston joint to include an outer member (28) configured for movement relative to the first and second elements along a first axis perpendicular to a common axis, the outer member defining first and second parallel flat sides (shown in figure 1), each flat side defining a plane perpendicular to the common axis and an inner member (30) mounted within the outer member for rotation relative to the outer member about a second axis perpendicular to the first axis and the common axis for movement relative to the outer member along the second axis and the outer member (28) being restrained from movement along the second axis in order to allow the necessary degrees of freedom for movement of the drive arm in the joint. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the joint as taught by Scalzo in order to reduce side load.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

16. The following references are cited to further show the state of the art with respect to piston joints: Forster (U.S. Patent No. 5,704,274) and Forster (U.S. Patent No. 5,699,715).

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Kyle whose telephone number is 703-305-3614. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 703-308-3179. The fax phone numbers for the

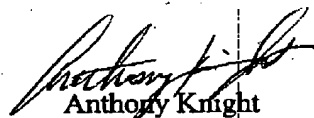
Application/Control Number: 09/778,629
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Page 8

organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-2168.

mk
September 26, 2002



Anthony Knight
Supervisory Patent Examiner
Tech Center 3600

Notice of References Cited

Application/Control No.

09/778,629

Applicant(s)/Patent Under
Reexamination
SANDERSON ET AL.

Examiner

Michael J Kyle

Art Unit

3676

Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-4,505,187	03-1985	Burgio di Aragona, Antonio	417/269
	B	US-5,699,715	12-1997	Forster, Franz	74/60
	C	US-5,704,274	01-1998	Forster, Franz	417/269
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
 Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

U.S. Patent and Trademark Office
 PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 10



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,629	02/07/2001	Robert A. Sandersen	09850-014001	9606

26171 7590 05/28/2003

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 WASHINGTON, DC 20005-3500

EXAMINER

KYLE, MICHAEL J

ART UNIT

PAPER NUMBER

3676

DATE MAILED: 05/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Response
 5/28/03
 8/28/03
 11/28/03
 CME

Docketed By Billing Secretary
 Due Date: 8/28/03
 Handled: 11/28/03
 Initials: ife

Office Action Summary

Application No.

09/778,629

Applicant(s)

SANDERSON ET AL.

Examiner

Michael J Kyle

Art Unit

3676

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 4-7
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5-8-14.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 4-5, 7-8, 11-13, and 15, are rejected under 35 U.S.C. 102(b) as being anticipated by UK 629,318 (UK '318). UK '318 discloses a joint for positioning between first and second elements (6), the first and second elements being arranged for linear motion along a common axis (left to right in figure 1), comprising an outer member (1, 2) configured for movement relative to the first and second elements along a first axis (top to bottom in figure 1) perpendicular to the common axis, the outer member defining first and second parallel flat sides, each flat side defining a plane perpendicular to the common axis (plane contains a line along the length of member 1, and is tangent to the member), the outer member defining an opening for receiving a drive arm (13). UK '318 also discloses an inner member (3) mounted within the outer member for rotation relative to the outer member about a second axis (figure 1, axis running into and out of the page) perpendicular to the first axis and the common axis for movement relative to the outer member along the second axis, the outer member being restrained from movement along the second axis, the inner member defining an opening for receiving the drive arm (13).

3. With respect to claim 2, UK '318 discloses the inner member (3) to comprise a cylindrical member.

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4. With respect to claim 4, UK '318 discloses the outer member to comprise a two-piece member (1 and 2).
5. With respect to claim 5, UK '318 discloses each piece of the two-piece member to include a first concave inner face. The examiner considers the inner face of (1) where member (2) is received to be the first concave inner face of member 1, and the inner face of (2) where inner member (3) is received to be the first concave inner face of member 2.
6. With respect to claim 7, UK '318 discloses each piece (1, 2) of the two-piece outer member to include a flat outer face (end faces of 1 and 2).
7. With respect to claim 8, UK '318 discloses each piece of the two-piece member to include a curved outer wall (shown in figure 2).
8. With respect to claim 11, UK '318 discloses the first and second elements (6) to each comprise a piston.
9. With respect to claim 12, UK '318 discloses the first element to comprise a piston (6) and the second element to comprise a guided rod (portion between bush 4 and piston 6, that connects the piston to the joint assembly).
10. With respect to claim 13, UK '318 discloses a connector (5), the connector defining a cavity (formed by item 4), the outer member (1, 2) and the inner member (3) being positioned within the cavity.
11. With respect to claim 15, UK '318 discloses a method of reducing side load in a double ended member, the double ended member including first and second elements (6) arranged for linear motion along an axis of the double ended member, the method comprising providing a joint (5) located between first and second elements (6), the joint including an outer member (1,

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2) configured for movement relative to the first and second elements (6) along a first axis (top to bottom of figure 1) perpendicular to the common axis, the outer member (1, 2) defining first and second parallel flat sides, each flat side defining a plane perpendicular to the common axis, the outer member defining an opening for receiving a drive arm (13) and an inner member (3) mounted within the outer member (1, 2) for rotation relative to the outer member about a second axis (into and out of the page in figure 1) perpendicular to the first axis and common axis. UK '318 also discloses the inner member (3) is configured for movement along the second axis and the outer member (1, 2) is restrained from movement along the second axis, the inner member defining an opening for receiving the drive arm (13), and transferring load between the first and second elements (6) and the drive arm mounted to the joint through two opposed surfaces of the outer member.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1-3 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scalzo (U.S. Patent No. 4,433,596) in view of UK '318. Scalzo discloses a joint for positioning at the end of a first element (24), the first element being arranged for linear motion along a common axis (top to bottom in figure 1), comprising an outer member (28) configured for movement relative to the first element along a first axis (left to right figure 1) perpendicular to

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the common axis, the outer member (28) defining first and second parallel flat sides (opposite sides in contact with wall 26), each flat side defining a plane perpendicular to the common axis, the outer member (28) defining an opening for receiving a drive arm (16). Scalzo also discloses an inner member (portion surrounding pin 30) mounted within the outer member for rotation relative to the outer member about a second axis (figure 1, axis running into and out of the page) perpendicular to the first axis and the common axis for movement relative to the outer member along the second axis, the outer member (28) being restrained from movement along the second axis. Scalzo does not disclose a second element or the inner member to define an opening for receiving the drive arm.

14. UK '318 teaches a first and second element (6, and portion connecting pistons to the joint shown in figure 1) moving along a common axis that allows the assembly to generate power in both directions of the stroke, rather than in just one direction. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Scalzo as taught by UK '318 in order to generate more power. UK '318 also teaches an inner member (3) to define an opening (shown in figure 1) to receive a drive arm (13). Separating the drive arm from the inner member allows for cheaper and easier replacement of the parts. Therefore, it would have been obvious to one of ordinary skill in the art to modify Scalzo as taught by UK '318 in order to allow for cheaper and easier replacement of the parts.

15. With respect to claim 2, Scalzo discloses the inner member to comprise a cylindrical member.

16. With respect to claim 3, Scalzo discloses the outer member to be configured to rotate about the common axis. The examiner references figure 3, where it appears that if the inner

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member moves to contact the inner wall of the outer member, a slight rotation will be incurred with the piston.

17. With respect to claim 11, Scalzo, once modified as taught by UK '318, discloses the first and second elements to each comprise a piston.

18. With respect to claim 12, Scalzo, once modified as taught by UK '318 discloses the first element to comprise a piston and the second element to comprise a guided rod (UK '318, portion between piston 6 and joint, shown in figure 1, that connects to the piston with bolts as shown).

19. With respect to claim 13, Scalzo, as modified by UK '318, discloses the joint further comprising a connector for mounting the first and second elements, the connector defining a cavity (area bounded by wall 26 in Scalzo), the outer member (28 of Scalzo) and the inner member being positioned within the cavity.

20. With respect to claim 14, Scalzo discloses the connector to define a rectangular cavity having four flat inner walls (shown in figures 1 and 3).

21. With respect to claim 15, Scalzo discloses a method of reducing side load in a double ended member, the double ended member including a first element (24) arranged for linear motion along an axis of the double ended member, the method comprising providing a joint located at one end of the first element, the joint including an outer member (28) configured for movement relative to the first element along a first axis (left to right of figure 1) perpendicular to the common axis, the outer member (28) defining first and second parallel flat sides (flat sides contact wall 26 shown in figure 1), each flat side defining a plane perpendicular to the common axis, the outer member (28) defining an opening for receiving a drive arm (16) and an inner member (portion surrounding pin 30) mounted within the outer member (28) for rotation relative

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to the outer member about a second axis (into and out of the page in figure 1) perpendicular to the first axis and common axis. Scalzo also discloses the inner member is configured for movement along the second axis (figure 3) and the outer member (28) is restrained from movement along the second axis. Scalzo does not disclose a second element or the inner member to define an opening for receiving the drive arm.

22. UK '318 teaches a first and second element (6, and portion connecting pistons to the joint shown in figure 1) moving along a common axis that allows the assembly to generate power in both directions of the stroke, rather than in just one direction. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Scalzo as taught by UK '318 in order to generate more power. UK '318 also teaches an inner member (3) to define an opening (shown in figure 1) to receive a drive arm (13). Separating the drive arm from the inner member allows for cheaper and easier replacement of the parts. Therefore, it would have been obvious to one of ordinary skill in the art to modify Scalzo as taught by UK '318 in order to allow for cheaper and easier replacement of the parts.

23. Scalzo, once modified as taught by UK '318 discloses the step of transferring the load between the first and second elements and a drive arm (16 of Scalzo) mounted to the joint through two opposed surfaces of the outer member.

24. Claims 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scalzo in view of UK '318 as applied to claim 1 above, and further in view of Kenny (U.S. Patent No. 4,489,682). Scalzo does not disclose the outer member to comprise a two-piece member.

25. Kenny teaches an outer member (18) comprising a two-piece member (shown in figure 2) wherein each piece of the two-piece member includes a first concave inner face and an additional

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concave inner face arrange perpendicular to the first concave inner face, so that the inner member may be securely fastened in the two-piece member, the inner member can rotate in the two-piece member, and so the driving arm can move freely in the aperture formed by the additional concave inner faces formed in each two piece member. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the outer member of Scalzo and UK '318 as taught by Kenny to securely mount the inner member within the outer member and still allow rotation of the inner member and drive arm.

26. With respect to claim 7, Scalzo, as modified by Kenny, discloses each piece of the two-piece member to include a flat outer face.

27. With respect to claims 8 and 9, Kenny shows each two-piece member to include two curved outer walls (left most and right most walls of 18 in figure 2).

28. With respect to claim 10, Kenny shows the outer member to comprise a two piece member, each piece of the two piece member having first and second concave perpendicular cut-outs on an inner face, a flat outer surface, and two curved side walls.

Response to Arguments

29. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection. These claims are now rejected under 35 U.S.C. 102(b) as being anticipated by UK 629,318, 35 U.S.C. 103(a) as being unpatentable over Scalzo (U.S. Patent No. 4,433,596) in view of UK '318, and 35 U.S.C. 103(a) as being unpatentable over Scalzo in view of UK '318 and further in view of Kenny (U.S. Patent No. 4,489,682).

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Conclusion

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Kyle whose telephone number is 703-305-3614. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.
31. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 703-308-3179. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications.
32. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-2168.

mk
May 21, 2003


Anthony Knight
Supervisory Patent Examiner
Tech Center 3600